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The English translation will consist of two volumes, the second treating of the origin of varieties and also of the general problems of the origin of new forms. The second volume is announced to appear in April.—J. M. C.

MINOR NOTICES

Knuth's handbook.—The third volume of the English translation of KNUTH'S *Handbuch der Blutenbiologie* has just appeared[4] and completes the work. The original volumes and the two preceding volumes of the translation were reviewed in this journal,[5] so that the general scope and character of the work have been noted. The first volume is a general one, treating of the structure of flowers and of insects in relation to pollination. The second volume is a record of observations on flower pollination made in Europe and the arctic regions, arranged by natural orders and extending from "Ranunculaceae to Stylideae." The present volume continues the subject of the second and includes the natural orders from "Goodenovieae to Cycadeae." The encyclopedic character of the work may be judged by the fact that the second and third volumes contain observations on 1048 genera and 3112 species of plants. There is appended a systematic list of insect visitors recorded in these two volumes, arranged alphabetically and with the names of the plants visited, and the number of species reaches 2888.

Such a work cannot be reviewed, it can only be announced. The burden of translation must have been enormous, but it has introduced English-reading botanists to an immense body of facts, and may serve to stimulate work in this attractive field. The total cost of the three volumes ($24.25 in cloth, and $27.25 in half morocco) may seem somewhat prohibitive, but the work may be made available in libraries.—J. M. C.

A new laboratory guide.—The widespread interest in the teaching of botany in secondary schools is shown by the abundance of new textbooks and laboratory manuals. One of the latest of the latter is by CLUTE.[6] It is divided into two parts; the first deals with the usual topics in connection with the structure and activities of angiosperms, and the latter with the great plant groups. Its most striking features seem to be the small number of exercises, each of which is very comprehensive; the large number of suggestive questions; and the useful set of definitions accompanying each exercise. The directions to the pupil are mainly contained in the questions, and these are very numerous (99 in one of the exercises). Complete answering of these would demand careful study of the material used, though possibly without sufficiently encouraging initiative. The book should be useful in classes somewhat above the grade of the first year in the high school, especially in those laboratories where very full directions are needed. At the same time, it is a question whether the author does not err, in common with many other writers of textbooks of this class, in giving structure complete predominance. In the study of living things it would appear that vital processes and relations should furnish the motive of the course. At any rate, it is scarcely fair to the pupil's perspective to relegate physiology to a few pages, in the nature of an appendix, with occasional references from the body of the text. One would prefer it to be an integral and important part of the laboratory directions.—W. L. EIKENBERRY.

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[4] KNUTH, PAUL, Handbook of flower pollination, based upon HERMANN MÜLLER'S work "The fertilization of flowers by insects." Translated by J. R. AINSWORTH DAVIS. Vol. III. 8vo. pp. iv+644. *figs. 208*. Oxford: Clarendon Press. 1909. Cloth $8.75.

[5] BOT. GAZETTE **28**:280. 1899; **28**:432. 1899; **42**:494. 1906; **46**:63. 1908.

[6] CLUTE, WILLARD N., Laboratory botany for the high school. pp. xiv+177. Boston: Ginn & Co. 1909. 75 cents.

North American flora.[7]—Volume XVI, part I, of this work contains an elaboration of the Ophioglossales-Filicales as follows: Ophioglossaceae by L. M. UNDERWOOD and R. C. BENEDICT; Marattiaceae by L. M. UNDERWOOD; Osmundaceae and Ceratopteridaceae by R. C. BENEDICT; Schizaeaceae, Gleicheniaceae, and Cyatheaceae (pars) by W. R. MAXON. New species are described in the following genera: Ophioglossum (1), Danaea (1), Marattia (1), Aneimia (7), Dicranopteris (1), and Cyathea (4).—J. M. GREENMAN.

NOTES FOR STUDENTS

Chromosome reduction in Oenothera.—DAVIS[8] publishes an account of chromosome reduction in *Oenothera grandiflora* which is a strong confirmation of the earlier work of GEERTS[9] on *O. Lamarckiana*, and of the reviewer on *O. Lamarckiana* and a number of its mutants and hybrids, especially *O. rubrinervis.*[10] As regards the main facts of reduction the results are the same in all three cases, and even many of the finer details of the reviewer's results are here corroborated, though there are evidently certain differences of behavior between *O. Lamarckiana*

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[7] North American Flora, Vol. XVI, part I, pp. 1–88. New York Botanical Garden. 1909.

[8] DAVIS, B. M., Cytological studies on Oenothera. I. Pollen development of *Oenothera grandiflora.* Annals of Botany **23**:551–571. *pls. 41, 42.* 1909.

[9] GEERTS, J. M., Beiträge zur Kenntnis der cytologischen Entwicklung von *Oenothera Lamarckiana.* Ber. Deutsch. Bot. Gesells. **26a**:608–614. 1908.

———, Beiträge zur Kenntnis der Cytologie und der partiellen Sterilität von *Oenothera Lamarckiana.* Rec. Travaux Bot. Néerlandais **5**:93–208. *pls. 5–22.* 1909.

[10] GATES, R. R., Pollen development in hybrids of *Oenothera lata* × *O. Lamarckiana*, and its relation to mutation. BOT. GAZETTE **43**:81–115. *pls. 2–4.* 1907.

———, Hybridization and germ cells of *Oenothera mutants.* BOT. GAZETTE **44**:1–21. *figs. 3.* 1907.

———, A study of reduction in *Oenothera rubrinervis.* BOT. GAZETTE **46**:1–34. *pls. 1–3.* 1908.

———, The behavior of chromosomes in *Oenothera lata* × *O. gigas.* BOT. GAZETTE **48**:179–199. *pls. 12–14.* 1909.